

## REMARKS

Claims 1-22 stand rejected. By this paper, Claims 1, 12, 14, and 15 are amended, and Claim 13 is cancelled. The amendments add no new matter. Thus, Claims 1-12 and 14-22 are presented for further examination in light of the below remarks

### Claim Rejections under 35 U.S.C. § 102

The Examiner asserts that Claims 1-7 of the present application are anticipated by U.S. Patent Application No. 2003/0069142 A1 ("Beal").

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); See MPEP § 2131.01. Applicant asserts that Beal fails to provide each and every element of Claims 1-7 and thus cannot defeat their novelty.

Amended Claim 1 recites in part, "A method for treatment of untreated injection water for a subsea injection well, said injection water being one of: water from a body of water overlying the injection well, and produced water from a well production stream." (Emphasis added). Beal teaches "a delivery system for delivering a chemical oxidant to groundwater for treatment." See Beal paragraph 17. This delivery system involves the placement of one or several chemicals in one or several injection wells. See Beal paragraph 17. Groundwater around the injection well is then able to flow through the injection wells, thus dissolving and dispersing the chemicals throughout the groundwater reservoir. In contrast to the features of Claim 1, this groundwater is not "from a body of water overlying the injection well," but is rather the body of water at the bottom of the injection well. Additionally, the treated water in Beal is not "produced water from a well production stream" but is rather ground water. Because Beal fails to teach these features of Claim 1, it cannot defeat the novelty of Claim 1.

Amended Claim 1 additionally recites, "lowering a water treatment apparatus and a water injection pumping equipment connected thereto into said body of water overlying the subsea injection well." As discussed above, Beal only teaches the treatment of groundwater located at the bottom of an injection well. See Beal Paragraph 17. Additionally, Beal never refers to the injection well having a subsea location, but rather indicates that the injection well is located on

top of land. See for example Beal paragraphs 20 describing installation of injection wells with a backhoe. Because the treated water in Beal is located at the bottom of the injection well, it is not a "body of water overlying the subsea injection well" as recited in Claim 1. Additionally, the injection well described in Beal is not a "subsea injection well" as recited in Claim 1.

Beal additionally fails to disclose "water injection pumping equipment" as recited in Claim 1. In contrast to "water injection pumping equipment" as disclosed in Claim 1, Beal does not teach the use of any "pumping equipment." In contrast to "pumping equipment" Beal relies on the baffles to direct ground water to and from the injection well and then relies on groundwater flow rates to distribute the treated water. See for example Beal paragraph 24. As Beal fails to disclose any "water injection pumping equipment" and thus fails to teach this feature of Claim 1, it cannot defeat the novelty of Claim 1.

Amended Claim 1 also recites, "an associated network of lines with valves for allowing flow of injection water through said receptacle and line network during water injection." In contrast, Beal discloses an injection well with baffles. These baffles are not "an associated network of lines" as they do not allow "flow of injection water through" the injection well, but rather direct external water to and from the injection well. Further, Beal makes no disclosure of any valve associated with the flow of water through a "receptacle and line network during water injection." Because Beal fails to disclose the use of "an associated network of lines with valves for allowing flow of injection water through said receptacle and line network during water injection" it does not provide each and every feature of Claim 1 and therefore cannot defeat the novelty of Claim 1.

Because Beal does not disclose each and every element of Claim 1, Applicant respectfully submits that the rejection of independent Claim 1 has been overcome. Additionally, none of the other references cited by the Examiner provide disclosure which cures the deficiencies of Beal and thus also do not defeat the novelty of Claim 1. Therefore, allowance of Claim 1 is respectfully requested.

Claims 2-11 depend directly or indirectly from Claim 1 and, thus, are patentable for at least the same reasons that Claim 1 is patentable over the applied art. Therefore, allowance of Claims 1-11 is respectfully requested.

**Claim Rejections under 35 U.S.C. § 103**

The Examiner asserts that Claims 8-12 and 14-22 are unpatentable under 35 U.S.C. § 103. As discussed above, claims 8-11 depend directly or indirectly from Claim 1 and are patentable for at least the same reasons that Claim 1 is patentable.

Before claims are unpatentable due to obviousness, the Examiner must find, "that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods." *KSR*, 550 U.S. 398,417-19 (2007); *Sakraida v. AG Pro, Inc.*, 425 U.S. 273, 282, 189 USPQ 449, 453 (1976); *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57, 62-63, 163 USPQ 673, 675 (1969); *Great Atlantic & P. Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 152, 87 USPQ 303, 306 (1950); See MPEP 2143. Applicant asserts that rejected Claim 12 is not obvious over U.S. Patent No. 6,196,314 ("Chen") in view of U.S. Patent No. 3,727,760 ("Soriano") as these do not provide all of the features of the claim and to the extent that they do, one skilled in the art could not have combined the elements as claimed by known methods.

Claim 12 recites in part, "wherein the water treatment apparatus is structured for connection to a water injection pumping equipment so as to allow said apparatus and pumping equipment to be lowered into a body of water overlying the subsea injection well and then to be connected to the injection well." The Examiner asserts that it would have been obvious for one of skill in the art to "modify the Chen reference with the Soriano reference by using the solid chemicals and dispenser, since it is within the ordinary skill of one in the art to change one type of chemical dispenser with another type to serve its intended use." The Examiner further asserts that it would have been obvious to one of ordinary skill in the art to "modify the location of the pump in the Chen reference since it is within the ordinary skill of one in the art to relocate parts."

In contrast to this assertion, Claim 12 requires the placement of both the water treatment apparatus and the water injection pumping equipment under water. Further, as this placement is of an entire facility as opposed to a mere part, and as it involves placement in a different environment as opposed to a different part of an apparatus or process, this relocation would not have been within the abilities of a person of ordinary skill in the art.

Applicant respectfully asserts that neither of the references provided provide a "water treatment apparatus . . . structured . . . so as to allow said apparatus . . . to be lowered into a body of water." The prior art, including Chen, discloses the use of above sea-surface facilities to treat water such that it may be injected to assist in hydrocarbon recovery. As stated in the specification, such facilities have several drawbacks, among which is a cost sufficiently high to prevent use with smaller fields. Claims 1 and 12 are directed at an apparatus and method which increase the productivity of these marginal fields, as well as hydrocarbon fields in general by designing a water treatment apparatus that can be located under-water in close proximity to the injection well.

In addition to the significant advantages provided over the prior art, the location of the entire water treatment apparatus under water is more than relocation of a mere component. While a person of ordinary skill in the art may be able to move a portion of an apparatus or process, there is a significant difference between the movement of a component and the movement of an entire facility. While the movement of a component may require design adjustments, the relocation of facility presents numerous challenges both known and unknown. As such, while the relocation of a component may be within the level of ordinary skill in the art, the relocation of an entire facility would require more than the skill possessed by one of ordinary skill in the art. Additionally, because the placement of the facility underwater involves designing for a new environment, this placement is more than the mere relocation of a part. Finally, this placement in another environment would be beyond the level of skill possessed by a person of ordinary skill in the art as it involves addressing economic difficulties faced by marginal fields by placing a facility in an environment that is more expensive and more difficult to work in. This counterintuitive benefit achieved by the location of a treatment facility underwater further makes the location of the water treatment apparatus and water injection pumping equipment something beyond the realm of ordinary skill in the art. Because of the unknown problems faced by the placement of an entire facility in a different environment and the counterintuitive benefit achieved thereby, a person of ordinary skill in the art would not be able to perform this relocation as suggested by the Examiner.

Additionally, as mentioned in the specification, the features of Claim 12 provide other significant advantages over the prior art, many of which come from the use of solid chemicals.

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While it may be true that it would be obvious to combine Chen and Soriano to create a treatment facility which uses solid chemicals, it is not obvious that the combination of Chen and Soriano would overcome the environmental problems associated with the location of a water treatment apparatus under water. As evidenced by the two studies mentioned in the specification as dealing with the underwater treatment of water, no study had contemplated the use of solid chemicals to overcome problems of cost and variety of treatment options inherent in the location of a treatment facility underwater.

Because a person of ordinary skill in the art would not have been able to combine Chen or Soriano as suggested by the examiner to achieve the features of Claim 12, the combination of Chen and Soriano does not render Claim 12 unpatentable. Additionally, none of the other art cited by the Examiner contains disclosure which cures the deficiencies of Chen and Soriano and thus cannot render Claim 12 unpatentable. Applicant therefore respectfully requests that the Examiner withdraw the rejection to Claim 12.

Claims 14-22 depend directly or indirectly from Claim 12 and, thus, are patentable for at least the same reasons that Claim 12 is patentable over the applied art. Therefore, allowance of Claims 12 and 14-22 is respectfully requested.

*No Disclaimers or Disavowals*

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application. Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

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Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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